

Information Management for University Computer Labs

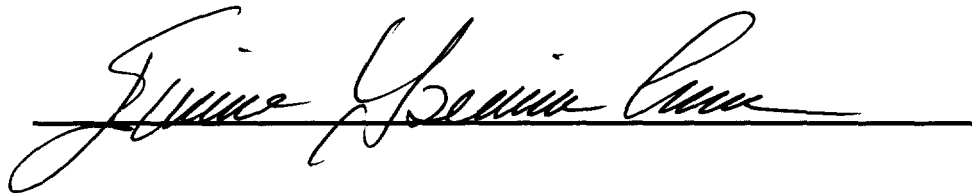
An Honors Thesis (HONRS 499)

by

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A handwritten signature in cursive script, reading "Yasemin Tunc", is written over a solid horizontal line.

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Abstract

During the course of the fall semester of 1997 I was employed as Information Manager for University Computer Labs. Through this opportunity I gained experience in a wide variety of areas. This text explains the background and purpose of my work and also details the databases that I reworked and created from scratch. Also included is a narrative of what was learned through this experience and what plans I have for the future of this project. Throughout the text examples are given on the possible uses of the data worked with and sample reports created are included.

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Introduction

As I began to actually write this text, I realized just what a daunting task it would be. Throughout this semester I have worked very hard to accomplish the goals set out for this project. However, actually sitting down and attempting to explain them has turned out to be difficult.

To many, creating and maintaining databases may not seem like a very good choice for an honors thesis. Nor would many consider it a creative project. To me it is both a perfect choice for my thesis and definitely a creative project. Taking raw data and making it into something of use takes creativity. It also takes creativity to develop an application that can be used by others to reproduce results with new data.

The Ball State Honors College allows its student to take courses in things that they may never have had the opportunity to. I see the thesis requirement as a part of this as well. An honors thesis is a student's opportunity to do work in an area they choose and not one that is on a list of requirements for a degree. For me, most all of the courses I have taken at Ball State have taught me something and told me how to apply it to "real life situations." The work I have done for this thesis is a "real life situation." If I fail at this work, it does not only affect my grade or me. If I fail at this work, I have failed many people; University Computer Labs, University Computing Services, and also the students and staff of Ball State University. Now, the world would not end for these people without the data

I process or the reports I prepare, but the quality of service received by users and the hardware and software available to them could possibly suffer. This element of realism has taught me much more than any class could have. It has prepared me more for life outside the security of school. The opportunity to complete this work has been beneficial and I hope this written work can adequately explain it.

In order to fully explain my activities of this semester, I feel it wise to give some background information. I will begin by explaining University Computer Labs, then my position as Information Manager. I will then describe the process by which information is obtained from the labs and also what is done with this information. In addition, I will include information about the database I created and now maintain on lab assistant software training. I will finish up with what I have learned and what my plans are for the future with this position.

University Computer Labs

Ball State University offers many resources to students. These resources include computer lab facilities. University Computer Labs functions under University Computing Services to manage, staff, and equip these labs. University Computer Labs currently manages twenty-five labs throughout the Ball State campus.

Since computer technology is expanding at an almost exponential rate, each semester at least some of the resources that University

Computer Labs offers become obsolete. Also, each semester the needs of the lab users change. These needs may be software packages or they may be lab hours. In order to address these issues, University Computer Labs must periodically review their resources. Determinations need to be made about replacing hardware or software available in the labs, and also whether or not lab hours meet the needs of the university.

In order to make informed decisions about lab hours and equipment purchases lab usage and needs must be assessed. Determining how many users there are for each lab, for what class they are using the computer, their software preference and their hardware preference does this. This information is gathered for each user who enters a lab. In addition to gathering information, the process also serves as a means of security for the hardware and software.

To give a more detailed picture of how this information is gathered, I will outline the process by which information is gathered about lab usage and needs.

Sign In Procedure

Upon entering a computer lab, a user is required to show the lab assistant a Ball State University identification card, or acceptable temporary permission slip from University Computer Labs. The lab assistant records the users identification number, the course for which they will be using the computer, the type of hardware they wish to use, and

the type of software they will be using, and also the station number where they will be seated. The station that at which the student is seated at is shown as occupied on the screen of the sign-in program.

This information is recorded using a custom computer program. The program keeps all of the entries on its hard drive until the data is downloaded onto a disk. Additional files are also created from the data that can be used to pinpoint who used a particular computer on a particular date and time. When the user leaves the lab, the assistant simply signs that user out and then the station is shown as unoccupied.

In addition to signing users in and out of the lab, the lab assistant also fills out a headcount sheet. Each hour on the half-hour the assistant marks down the number of users in the lab on the form. This sheet is then used to estimate usage if no computer data is available and also determine peak lab usage times and days.

Information Manager

Collecting, sorting, organizing, and reporting this information is where the job of Information Manager comes in. The Information Manager is responsible for stocking each lab with headcount sheets and sign in diskettes. The Information Manager also takes the data from each lab and combines the data into one database. From this database, reports are generated to display lab usage and needs.

Beginning in August of 1997, I became the Information Manager for University Computer Labs. I will continue this position as a Graduate Assistant in the spring of 1998. This position has proven to be very challenging. This project has involved dealing with not only software, but also people. Working with the data required me to learn and add to my computer skills.

Each week, the manager or supervisor for each lab downloads the week's sign-in data onto an appropriately labeled diskette. The disk is turned into me along with the week's headcount sheet. I am responsible for making sure that each lab has an adequate supply of diskettes and headcount sheets.

The information from the diskettes is imported into the database. Information from labs that do not sign each user in (such as RB 134 Main) is estimated from headcount data and entered into the database. From the entered information a weekly report is created (see Appendix B for an example.) This report contains information on the total number of users for that week, the number of users for each individual lab, the usage for each academic college, the usage for each hardware category, along with a breakdown of each software category and individual software items.

The data collected from the headcount sheets are entered by hand into the database. The information from this table is then exported into

Microsoft Excel in order to create complex graphs. These graphs compare daily usage at each hour on the half-hour (see Appendix B for examples.)

Usage Statistics Database

The previous Information Manager, Robert Lund, created the database that I worked with this semester for the usage statistics. Robert created the database using Microsoft Access 2.0. I met with Robert before I began my position to learn about the database he created. After working some with the database and figuring out how it worked I moved the file up to a newer version of Access, Access 97. In addition to converting the database to a new version I also worked out some of the bugs and added to database.

Usage Statistics Database: Redesign

The database that I managed this semester was already near completion when I took over the position of Information Manager. However many changes needed to be done. After I converted the database to Access 97 I made a few changes to the appearance of the forms. I did this not only for aesthetic reasons, but also to improve upon the user interface. This database needs to do more than function properly for me. The database will need to have good documentation and an effective user interface for the future. The database is of little future use if only I know how to work it.

After altering the user interface, I studied the current tables, queries, reports and forms. Some of these were incomplete or did not function

properly. In general, however, the database ran smoothly. Many of the changes made were for the sake of clarity, faster queries, and to take advantage of the newer version of the software.

Usage Statistics Database: Tables

The central table of the entire database is one that contains the information gathered from the sign-in diskettes each week. This table, named UCL1, is the most important table because it is the core of the information and it also links most all other tables and queries together.

UCL1 consists of the following fields:

- ◆ Record identification number
- ◆ Lab name
- ◆ User identification number
- ◆ Sign-in date
- ◆ Sign-in time
- ◆ Course abbreviation (XXX is used for personal work)
- ◆ Hardware used
- ◆ Software used
- ◆ Classification (Student, Class, or Faculty)

The record identification number is generated by the program for each record imported into the table. This field serves as the primary field for the table because no other field is unique to a particular record.

As I mentioned earlier, sign-in diskette data is imported into the database. The database has within it a macro that takes this data from the

diskette and downloads it into the UCL1 table at the touch of a button. However, this semester I was unable to utilize this feature. The sign-in program currently saves the file containing the lab usage data as signin.dat. Access will not recognize a file with this extension for import. This problem can be corrected by changing the filename on the disk to sign.txt. However, this did not turn out to be a viable solution.

University Computer Labs utilized a new sign-in program this semester. The program, created by lab supervisor Matthew James, modernized the previous version that ran on a DOS platform. The new sign-in program runs on the Windows platform and offers a more object oriented user interface. This newer version allows each lab to be set up with the software and hardware available for each lab. Supervisors and managers can also download the data onto disk using a menu. The previous DOS program had no such feature and data was put on disk periodically while the computer was running. On the down side, the program still has a few bugs to be worked out. Future versions of this program however will fix these problems and also name the resulting file signin.txt for convenience.

Due to these difficulties I have used a more time intensive method of importing the data. Now that I examine it though, I think that it has been beneficial to use this method because it has allowed me to work closely with the raw data and understand it a bit more. This method has also helped me pinpoint specific areas where the program is lacking. This

allows me to better communicate with the programmer about the needs of the program.

This method involves passing the data first to Microsoft Excel and then on to Access. I have created macros both for retrieving the signin.dat file from the disk and pasting that information into another workbook. I can then work with all of the week's data at once.

The most common errors that I need to correct involve the course abbreviation field. Many times the complete course abbreviation is not listed in the field. The correct abbreviation can usually be figured out quite easily and fixed quickly. Another common data error occurs when the end of a record is not recognized by the sign-in program and the new record is appended to it. In this instance, the data can be recovered only some of the time.

When the data is corrected on the Excel spreadsheet, the file is saved as a .txt (text) file. I have found that Access has also had some problems with importing Excel data although it does recognize the format. This text file is then imported into the UCL1 table.

Another integral table within the database contains information that links the course abbreviations listed in UCL1 to their proper departments and colleges. This allows for analysis of the computer usage for courses in each department or college as a whole. From this, determinations can be made about what types of software are needed both in general and in each

lab. For example, from the usage statistics it can be found that the majority of class work performed in labs located in the business building is within the College of Business. Therefore those labs should support software applications that are commonly needed by students in those courses. This would be the same case for another lab whose clientele primarily worked for classes in the Journalism department. The resources available in a lab can be tailored to the users by examining usage data.

Additional tables are also used to give a better understanding of user needs. One such table is one that includes information on the software offered in the labs and the category they fall into. The software field is also linked to the category into which the program falls. This allows for the usage or popularity of a program to be evaluated along with the number of users who need software of that category. This data can also be useful in determining what applications are needed in each lab and when they need to be upgraded. For instance, if it is found through the usage data that desktop publishing software is rarely if ever utilized in a particular lab, resources can be allocated to upgrading other software types that are more commonly used.

In addition to software used in labs, the usage of different types of hardware is also tracked. This hardware table is set up much like the software table. It links a hardware type found in UCL1 to a category. Currently the categories merely serve as a more explanatory title for the hardware (such as IBM Compatible as opposed to just IBM.) However, this

table allows for expansion upon the hardware types. This feature could be used in a case where there is a desire to track more specific types of hardware such as manufacturer or configuration. Adaptability is an idea that runs throughout the database. An underlying goal of the project is to create a product that can be adapted, as needs change without requiring a complete overhaul of the current program.

To relieve some of the strain of such a vast amount of records within the database a table for yearly lab usage is included. Total lab usage for an academic year can be entered into this table so that room is freed up to accept new data for the next academic year. As the number of records increases, the access speed of reports and queries decreases significantly. Near the end of an academic year when the number of records can reach near 500,000 the time it takes to run a small report can be upwards of an hour. Since the details of the information have been reported at year-end, only the total number of users is needed in the database. This number is kept in order to provide a usage comparison between semesters and academic years. I plan to incorporate more detailed information into this table in the future, allowing individual lab usage to be compared as well.

I have added one new table to the database. This table holds the information from the headcount sheets. This table may or may not be included in the future. Currently the information contained in this database is exported to Microsoft Excel in order to create complex graphs

that chart the number of users each hour for each day and also a line charting the average usage for all days. In the future, I will examine this data to determine if there is other information that can be extracted from this data. In the event that no additional information can be extracted, I will remove the table from the database and keep the information in Microsoft Excel files. This will reduce the size of the database and also allow the headcount information to be entered more easily. This is due to the nature of the headcount sheet, which lends itself to a spreadsheet program.

Usage Statistics Database: Queries

All of these tables do not do much to provide a picture of how the labs are utilized. Queries must be made of these tables in order to extract the information needed. The usage statistics database utilizes many queries. In an effort to be concise I will focus more on groups of queries and not each single query itself. Sometimes it is necessary to create many sub queries and combine information from them into another query.

By far the most important query within the database is the date query. Since data from only a specific time period is needed for reports, it is necessary to pick out only that data which is in that range is selected. The date query extracts the fields from the UCL1 table that fall between the dates specified by the user. Most other queries within the database are based upon the date query. Creating such a query is just one solution to

extracting data within a range. In the future, other solutions will be tested to see if faster queries can be designed.

The other main queries within the database are those on which the reports are based. This includes the user, lab, hardware, software, and college reports that combine to create the weekly report and also reports that are generated each semester and each academic year. Appendix A includes some samples from these reports.

The total user query is quite simple. The identification field is pulled from the date query and then totaled. This query, much like the date query, serves as a base for many others. It is used to make comparisons of small groups to the total usage. These calculations can show where the group of data stands against usage throughout the labs.

The lab query is one such query that utilizes the total user information. Sub queries gather information on the number of users for each lab. Other queries perform calculations on the total user data and lab user data. These calculations result in total users per lab and also what percentage the lab usage is of the total usage.

The query for the hardware report groups data for the specified date range by hardware type as is listed in the hardware table. A total for each type is calculated in another related query. Finally, percentages of each hardware type are calculated.

The query used for the software report functions much the same as that for the hardware report. Each software package is listed along with the number of users and a percentage of that package as compared to total usage. I took advantage of the software table and added to this query. It now breaks the data down first into categories and then the individual programs. So now the usage percentage of the entire category is compared to total usage and the usage of a program is compared to other programs within its own category.

Like the hardware and software queries, the college query also compares usage of a part to the whole. Information is pulled from the date query, and course abbreviations are linked to their respective colleges. The percentage of each college to the total number of users is calculated.

As with the hardware and software queries, many queries combine to gather the information for the college query. In addition to examining the possibility of modifying or eliminating the date query, I will also be examining these sub queries to see if some of them can be eliminated. This would result in faster queries and a smaller database. I feel that by streamlining the database much time would be saved generating reports and running queries.

In addition to queries used to create the weekly usage report, the database contains queries used to generate a semester and annual report. The bulk of this report consists of graphs used to visually relay the data.

The queries that go into these graphs are much like the ones used for the weekly report.

In fact, many of the queries can be used both for the weekly report and for the semester or annual report. The difference lies with how that data is used in the report. The queries that are created for the purpose of creating charts do not need the additional sub queries that calculate percentages. However, with the database software, the same query can be used because not all fields need be included in the report. The queries that are created for charts have more layering of groups. That is to say that for a college report the data is grouped not only by college but also by department. This is so charts can be created for all colleges combined, or for all departments in a college with a new chart for each college. Currently, the queries for weekly and semester reports are separate, however this is yet another area where single items can have a dual purpose and reduce clutter and improve clarity for others using the database.

Usage Statistics Database: Reports

As mentioned before, the main use of the queries is to create reports. There are two main reports that I create for University Computer Labs from the usage statistics. As with queries, it is sometimes necessary to create a report from smaller sub reports. This is the case with the main reports that I am responsible for generating.

The primary usage report that I generate is a weekly report. This report consists of information from all labs during a given week. This report is a combination of reports on total users, hardware, software, lab use, and college use. The details of each report are mainly like those of the queries on which they are based. With the report, I combine all of the elements in a format that is easy to read and interpret. Please refer to Appendix A for an example of a weekly report. This report can also serve as a sub report for a semester or annual report. In this case, the inclusive dates are those of the entire academic year or semester instead of only one week.

The second report that I am responsible for creating is a report that recaps the entire semester or academic year. Since this is my first semester at this position I have yet to generate this report. For the purpose of this project however I have created some samples of a mid-semester report. After the semester ends, I will compile the final results and generate a report including sub reports like the ones in Appendix A. The semester or annual report is almost entirely made up of graphs and charts. I believe that this is done to get the point across in an efficient and clear manner.

The report includes an introduction that explains the purpose of the report and some of cumulative data. Next, a chart is presented which outlines the yearly total usage over the course of the past few years. This chart gives a clear indication of where University Computer Labs is going.

Following that are charts depicting the breakdown of hardware use and also software use. With the addition of software categories, this section will include a chart on software category usage as well as a breakdown of usage within each category. The same is then done with the colleges. First displaying all colleges compared to each other, and then a break down of the departments within each college.

The next section shows data for each individual lab. The information for each lab includes the total number of users for the lab, the breakdown of hardware usage, the breakdown of software usage, and then also the graph created from Excel using the headcount sheet data. This chart compares average hourly usage per day and also the average hourly usage for all days. Since the graphing capabilities of Access are limited, these graphs are created in Excel and then saved as picture files. The location of each picture file is then placed within the lab table. The report references the filename and inserts it for each lab. As can be seen from the sample reports, the quality of these graphics is not up to par with the others. In preparation for the fall semester report, I will attempt to solve this problem. In the past, only an average hourly usage was displayed for all days thus enabling Access to create the graphs. The addition of including each day's hourly average adds to the information that can be gained from the data. For instance if a particular lab shows a peak period only on certain days, the number of staff members on duty could be increased for only those days.

Usage Statistics Database: Forms

Forms are not a vital component of a database. Information can be entered without them and queries and reports will function without them. Nonetheless, one of the purposes of this database is to be understandable to other possible users. Therefore, the user interface needs to be one that can be used by someone who does not necessarily know Access well enough to create a complex database. The forms within the database serve to ease data entry, assist with task completion, and add automation to the database.

A form is used as a main menu for the database. This menu gives the user several choices. They may import data from sign-in disks, produce reports, view the database window, enter headcount information, exit the program, or view info on the database.

When the user chooses to produce reports from the main menu, they are led to another menu. This report menu allows the user to designate the beginning and end date for the report they wish to generate. The user then has the option to cancel, preview the weekly report, print the weekly report, preview the semester report, or print the semester report. All of this can be done without the form, but the form adds convenience and speed to the process. Also this form can be used by anyone, even someone without much experience with Access.

Another form is used to enter headcount information. This could be done using the data sheet for the table, but the form lets the user view only one record at a time, thus reducing the chance of confusing one row for another. Also, the lab names in the lab table are linked to the form. The user can choose to use the pull down box to select the lab name, type the lab name. What this does is reduce the chance of a lab name being entered incorrectly. The name appears as it does in the table, so the format is consistent throughout the headcount table.

As one can see, forms are not necessary for a report, but they can make working with the database more pleasant and also increase the effectiveness of the database.

Training Database

Also as Information Manager, I created and maintained a database for keeping track of employee training. This part of my job presented a bit more of a challenge because I had no foundation to start from. I needed to create a database from scratch that worked, was concise, and had a good user interface. Working with the training statistics as an office assistant helped a great deal when accomplishing this task. I was also excited to use my creativity when designing and planning the database. My problem solving skills greatly increased from this task as well. I feel these are skills you can read about, but practice really teaches them to you.

First let me explain University Computer Labs' training program. All University Computer Lab employees are required to attend training. These sessions are taught by other lab employees that are chosen by the support staff because of their knowledge of the application. Several rounds of training are presented each semester offering a wide range of sessions.

Employees may also take certification exams in various applications. Certifications are usually done near the end of each semester. The certification exam tests the employee's knowledge of the software and ability to obtain help from the program in the event they are unfamiliar with a task. The amount of training an employee has undergone influences their rank when it comes time for shift scheduling. For these reasons, a database was needed to keep track of each employee's training.

In the past, each semester's training statistics were kept in an Excel workbook. Information on the types and number of training sessions was also contained in this workbook. The large number of employees and types of training sessions made it impossible to print data for even one individual on a single page. The individual sessions also had to be entered on a separate sheet within the workbook. This added time and redundancy to the data entry process and increased the time it took to create reports on the number of sessions offered for a given type and its attendance.

Training Database: Planning and Creation

My first step in creating this new database in Microsoft Access 97 was to evaluate what end results were needed from the database. I have found that keeping the end goal in mind greatly helps the creation process and eliminates unneeded clutter. From my past experience working with the training statistics as an office assistant and helping the Assistant Coordinator prepare reports on the training program I was able to come up with some basic goals for the database. These goals included items that were currently available with the spreadsheet method and also those that went beyond the spreadsheet's capabilities. The task of creating training report each semester was cumbersome and time consuming. Not so much because of the amount of data involved, but rather because of the difficulties of using the software to accomplish the tasks. I finally created the database with the following goals in mind:

- ◆ The ability to view and print information for one employee.
- ◆ The ability to view and print information for employees in a lab or a lab cluster.
- ◆ The ability to view and print information for all employees.
- ◆ The ability to track employee certifications.
- ◆ The ability to view and print a list of sessions by type and category.
- ◆ The ability to calculate the number of sessions of a particular type or in a particular category for a given span of time.
- ◆ The ability to track attendance of sessions.

Keeping these goals in mind, I laid out the structure of the tables within the database. I planned first on paper, and then created them in Access. In addition to planning out the fields for each table, I also plotted out the relationships these tables would have to one another and what field would serve as the primary and foreign key for each table. From this planning I came up with several tables that would be needed to store the information.

The advantage of using a database program like Access over a spreadsheet program such as Excel is that many tables can be created and then related to one another using fields that are common to them. This allows for queries and reports that can display only the information needed and also eliminates the need to duplicate information.

Training Database: Tables

I first determined that a table was needed to store the types of training sessions and their related category. University Computer Labs offers training sessions in a number of categories such as VAX, IBM, and Macintosh applications. There are several different sessions in each category, and these sessions change as user needs and technology changes. By linking the session and its category it becomes possible to report not only how many sessions were offered during a given time but also how many in each category. The link between the two also allows for employee reports that can identify how many sessions an employee has attended or passed a certification test for in each category. For example, if

a University Computer Labs employee passes six certification tests (two in each category) they are given the position of Lab Consultant. By linking the category and session, the database can be set up to identify Lab Consultants and also those that are close to that status. This can be done in only a few moments and the employee can see what categories they need more training in at a glance.

In addition to linking training categories with session types, it was also necessary to distinguish each session held. To do this I created a session table, which includes the session name, and the date the session was held. An additional field was created to assign each session it's own identification number. This identification number acts as the primary key for the table.

A link between the sessions offered and the employees attending the session needed to be created. To create this link I created an attendance table. This table includes a unique identification number for each attendance record, the identification number of the training session and the e-mail address of the employee. Specific information on the session name and the employee name can be accessed from the tables that contain the information via the linked fields such as the identification number from the session table and the e-mail address from the employee table.

A table containing employee information such as name, e-mail address, and primary lab was also needed. Since the e-mail address for

each employee will be unique, I chose this field for the primary key. Using the e-mail address as the primary key eliminates the need to retype the employee's name over and over. The name can be entered once. When recording attendance for training sessions, just the e-mail address can be entered. This not only speeds up the process of data entry, but also reduces entry errors and errors due to nicknames or maiden names. If the employee's name changes, or if the name the employee goes by is different than their given name, the name need only be changed in the employee table and then all reports will reflect the change.

A table was also created containing each lab and the corresponding lab cluster. Each lab belongs to a cluster of labs. The lab in which an employee has the most hours in is their primary lab. The cluster to which the lab belongs is therefore the employee's cluster. By creating a link between primary lab and lab cluster it is possible to create reports based on either one lab, or a group of labs. For example, a report containing training sessions attended by all employees in a lab can be created for each lab supervisor. A report of all sessions attended by employees in a cluster can be created for all cluster managers, and a report for all employees can be created for University Computer Labs support staff.

Training Database: Queries

From the tables that I created, I developed queries. I needed to create queries that would pull out the information I needed to fulfil the goal I had set. The queries wound up in one of two categories, either queries on

employees and the sessions they attended, or on the sessions themselves, their number and category.

For the attendance queries, I pulled the information from the attendance table. Instead of using a separate date query to filter the information to include only data for a set date range, I included parameters for the date directly in the attendance query. This will later on assist me in doing the same for the usage statistics database. From this information I had a link to the session and the employee. I pulled the employee name from the employee table, and the session name and date from the session table. The result was a display of the employee's name, the session(s) attended, and the date of those sessions. I later returned to the attendance table to include a field for certification. During my original planning I overlooked that goal. The query selects this certification information from the attendance table.

The second group of queries mainly focused on the sessions themselves. Again using the attendance table, I was able to link that information to the sessions. This link allowed me to calculate the number of sessions offered for each application, thus in each category as well. There is a chance that two sessions for the same applications could be offered on the same day. Sessions offered the same day are distinguished from one another by the identification number assigned to each session. The number of employees attending each session or session category is also calculated. This information is useful when analyzing what training

sessions are needed, which sessions should there be more of, what days are best for sessions, and for what categories there is a lack of sessions.

Training Database: Reports

From the queries I created, I generated reports. These reports needed to be concise and deliver the necessary information. These reports also broke into the same two groups as the queries.

Within the attendance category, I created two reports. One report includes individual information. The report lists the employee's name, the name of each session attended, the date of each session, the number of sessions attended, and also the text "certified" if the certification field in the attendance table is true.

The second report in the attendance group can be used for a lab report, cluster report, or a report for all clusters. This information lists employee names, the sessions attended and totals the sessions. Certification information is also displayed as in the individual report. The footer of each page indicates what cluster the employees belong to.

These reports provide supervisors, managers, and support staff with more readable information than before. In contrast to a tiny grid that one must follow across a row to locate the dates of sessions attended, now a list is presented with the sessions totaled and certifications noted. This makes for a much more useful report.

Only one report needed to be created to display information on training sessions. The report lists the session categories, the sessions contained within them, the number of sessions offered during the time period, and the total attendance for each session type as well as each category. The individual attendance for each session can also be noted. The next time a report of sessions offered is needed the process will be quick and more efficient than before. Appendix B includes a sample of these reports.

The great thing I have discovered about reports created with Access is that you have no need to re create reports over and over. You set the style for the report and the fields, titles and calculations you wish to include. Each time you run the report, your selected data is inserted into the report without the need to totally create a report from scratch. This not only saves time, but it creates consistency as well. Each time a report is generated, one knows where to find certain information because it will always be located there until the design of the report is changed. And even if one changes the design, new reports can be created from the new design and old data without much effort. The amount of time and resources it takes to create the database and components saves time and resources in the long run.

Training Database: Forms

As with the usage statistics database, forms are not a necessity for the training database. However, I feel that the use of forms enhances the database and makes it more useful as well as saves time.

Like the usage statistics database, the training database begins with a menu. This menu allows the user to add to or change employee information, preview reports, or enter new training sessions.

The print preview menu allows that user to preview individual, lab, cluster, or campus wide reports. When the user selects one of these options, another small form appears directing them to enter the beginning and ending dates for their request.

The view or add employee information selection forwards the user to a form containing the employee information. The list can be scrolled through and records can added, edited, or deleted.

I feel that the form used to enter training sessions both takes advantage of the many features of Access and displays the skills that I have acquired over this semester.

The upper half of the form contains information about the session. This information will be entered into the session table. The form utilizes the pull down box that is also used in the headcount form in the usage statistics database. This box is linked to the session category table and allows the user to select the session name from the list or enter a new

name if the name does not currently exist in the category table. The user then enters the date of the session.

The bottom half of the form includes a sub form. The session identification number links this form to the main form. When a session is entered at the top, the session identification number appears on the sub form. The information from this sub form is placed in the attendance table. A pull down box is included that is linked to the employee table by the e-mail name. The user simply either types in the e-mail address or selects it from the list. The user then uses the navigation buttons on the bottom of the sub form to enter more attendees. The session identification number remains the same. To begin entering attendance for a new session, the user advances the form number by using the navigation buttons at the end of the main form. The session only needs to be entered one time and it is linked to each employee who attended it. A check box is also located on the sub form to record certifications.

What I Have Learned from this Project

I believe that I have learned a lot more than I anticipated both from this project as a whole and from writing this text. I knew that I would learn more computer skills, and hopefully increase my problem solving and communications skills, but I also learned much about myself. I have already noticed what effects this experience has had on my life. In the beginning I did not think one project could effect me that much.

Nonetheless, as I began writing this thesis, I realized for the first time just how much this has effected me and helped me. I think that I go into things with more confidence than I did before. Knowing that I am capable of handling such a responsibility has made me aware of my potential. Being trusted with such a responsibility has also made me more confident in my everyday life and made me a more outgoing person.

I had worked with Access before taking on this project. But, as I look back on it I was quite naive to think that this task would be an easy one. I have learned quite a bit about the application both from reworking an existing database and creating my own. Learning the features of the latest version of the software also proved to be a challenge. It was a challenge I enjoyed though. I think that I enjoyed it so much because I really care about the data involved. I really want University Computer Labs to be able to offer the best resources to the students. It actually offends me personally when I see blank boxes on headcount sheets or users not being signed in to a lab.

Also, I have basically been in most of the positions effected by this data at one time or another during my career at Ball State. First as a lab user, then as a lab assistant, then as a lab supervisor, then further down on the line as an office assistant and finally Information Manager. I have seen and participated in the data collection process at each stage. After this semester, I feel as though I know it better than myself.

After coming up with solutions to the problems I have encountered this semester, I am more eager to tackle problems that come up in other projects. I can now analyze a problem and assess what needs to be done. I can organize the facts and come up with a concise solution.

There is always room for improvement with the database and with my performance. I have a drive to constantly do better. That drive has been something I have lacked for much of my career at Ball State. This project presented to me a challenge. I have not been truly challenged in quite a long time. Honestly, at first that scared me because I was not sure that I could accomplish my goals. But, as I write this I realize that I have accomplished something and that makes me feel more confident that I can take this project ever further in the future.

One major goal of my advisor (and boss) is to make the usage statistics database virtually self-reliant. That is to eliminate the need for an Information Manager. Evolve the database to the point where the information is quickly entered and reports are generated. Admittedly, at first I thought that goal was a bit far fetched. After thinking about how far it has already come though, I think now that perhaps that can be a reality by the time I end my position as Information Manager. That is the goal I am working towards.

My Future Plans and Goals for this Project

I have already begun planning for the next semester. I have really thought a lot about my performance and I think I have a whole lot of room for improvement.

One of my plans for the next semester is to schedule specific times to perform tasks and stick to them. I have set these times aside on my calendar just as any class or meeting. I have an obligation to perform a specified task at a certain time. I think that was an area I was lacking in this semester. I caught myself a bit behind at times and that did not please me nor do I suppose it pleased my advisor. I feel that having a more set schedule within which to work will resolve this problem.

I also wish to make it a bit easier for assistants to record information on the headcount sheets. This semester I distributed disks and headcount sheets to the labs about five weeks at a time. In the spring I plan to distribute all sixteen weeks worth of disks and headcount sheets to all twenty-five labs. This will be a large task to undertake, but I feel it will help matters greatly.

For the upcoming semester I also plan on creating half-sheet sized headcount sheets for labs that are open only a few hours each day. The headcount sheet for each of the twenty-five labs is currently one entire sheet in size. I wish to make half-size sheets for some of the labs to reduce the paper wasted.

I am also in the process of designing a holder for the headcount sheets. Currently, each lab has one sheet out at a time, sometimes taped to a desk. My idea is to create a holder for the entire semester's worth of sheets that is sealed on three sides. This holder can be fixed to the desk, and also allows the sheets to be found each new week. The old sheet would simply be slipped out of the holder and turned in. The new sheet will be then exposed, ready to use.

Also, to help increase the use of the headcount sheet, I will do an audit of the headcount sheets each week. I performed one such audit during the past semester. I feel a weekly audit would be much more beneficial. The audit would consist of examining each headcount sheet and marked each time there is a spot where the headcount was not taken. These holes will then be cross-referenced to the employee work schedule to determine who was on duty at the time. A report of these holes and employees will then be sent to lab supervisors and cluster managers. I think this communication will help both my data collection, and also the managers and supervisors with maintaining strong work habits among their employees.

In general, my goals for this project are to become more organized and communicate more with all involved. In the past I have been timid about voicing my concerns, but I feel it necessary to accomplish my goals and those of University Computer Labs.

Conclusion

In short, I feel that this project has taught me life long lessons that cannot be learned from any class or book. The lessons that I have already learned and those I hope to learn in the future will stay with me no matter where life may take me.

Appendix A

- ◆ Sample weekly report
- ◆ Sample of weekly report format used for a mid-semester report
- ◆ Chart depicting lab usage by college for 8/25/97 – 10/12/97
- ◆ Sample chart series breaking down college usage by each department
 - ◆ Applied Science & Technology
 - ◆ Architecture & Planning
 - ◆ Business
 - ◆ Communication, Information, & Media
 - ◆ Fine Arts
 - ◆ Interdepartmental Programs
 - ◆ Teachers College
- ◆ Sample report series depicting lab usage statistics sorted by lab
 - ◆ ABG21
 - ◆ AC314
 - ◆ AT208
 - ◆ BB220
 - ◆ Beeman Hall
 - ◆ BLL08
 - ◆ CL469
 - ◆ CN313
 - ◆ HP101
 - ◆ LU121
 - ◆ NQ323
 - ◆ RB134C
 - ◆ RB134F
 - ◆ RB134G
 - ◆ Rogers Hall
 - ◆ SCL23
 - ◆ Palmer Hall (STW)
 - ◆ TC709
 - ◆ WB202
 - ◆ WB212
 - ◆ WB213
 - ◆ WB216

University Computer Labs Lab Usage Statistics

For the Week of : Monday, October 06, 1997 - Sunday, October 12, 1997

Total Number of Users: 11,479

College Report			Lab Report		
<i>College</i>	<i># of Users</i>	<i>% of All Users</i>	<i>Lab Name</i>	<i># of Users</i>	<i>% of All Users</i>
Applied Science & Technology	210	1.8%	ABG21	870	7.6%
Architecture & Planning	585	5.1%	AT208	396	3.4%
Business	551	4.8%	BB220	32	0.3%
Communication, Information, & Media	214	1.9%	Beeman	753	6.6%
Fine Arts	48	0.4%	BLL08	2099	18.3%
Non-Class Work	8141	70.9%	CL469	110	1.0%
Science & Humanities	824	7.2%	HP 101	994	8.7%
Teachers College	92	0.8%	LU121	95	0.8%
			Noyer	1195	10.4%
			Palmer	403	3.5%
			RB134C	1059	9.2%
			RB134F	73	0.6%
			Rogers	676	5.9%
			SCL23	1226	10.7%
			WB202	174	1.5%
			WB212	404	3.5%
			WB213	175	1.5%
			WB216	745	6.5%

Hardware Report		
<i>Hardware</i>	<i># of Users</i>	<i>% of All Users</i>
SUN Station	107	0.9%
VT Terminal	548	4.8%
Macintosh	2973	25.9%
IBM Compatible	7848	68.4%

Program Report

<i>Software Type</i>	<i>Program</i>	<i># of Program Users</i>	<i>% of SoftwareType</i>
Courseware			
	ADAM	13	22.4%
	DIETARY ANALYSIS SOF	33	56.9%
	EDTECH CD	8	13.8%
	SYBYL	4	6.9%

Total # of Software Type Used: 58 100.0%

Database

Database	1	100.0%
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Total # of Software Type Used: 1 100.0%

Desktop Publishing

Desktop Publishing	301	100.0%
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Total # of Software Type Used: 301 100.0%

GIS

ARCINFO	42	75.0%
ARCVIEW	10	17.9%
IMAGINE	1	1.8%
ISLAND SOFT	3	5.4%

Total # of Software Type Used: 56 100.0%

Graphics

Graphics	267	100.0%
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Internet

E-Mail	8658	97.5%
Internet	113	1.3%
Netscape	110	1.2%

Spreadsheet

MS Excel	1	0.8%
Spreadsheet	117	99.2%

Word Processing

MS Word 97	38	2.2%
Word Perfect 7.0	8	0.5%
Word Processing	1719	97.4%

University Computer Labs Lab Usage Statistics

For the Dates of : Monday, August 25, 1997 - Sunday, October 12, 1997

Total Number of Users: 78,828

College Report

<i>College</i>	<i># of Users</i>	<i>% of All Users</i>
Applied Science & Technology	1708	2.2%
Architecture & Planning	2623	3.3%
Business	3128	4.0%
Communication, Information, & Media	1369	1.7%
Fine Arts	909	1.2%
Interdepartmental Programs	8	0.0%
Non-Class Work	62177	78.9%
Science & Humanities	5882	7.5%
Teachers College	1024	1.3%

Lab Report

<i>Lab Name</i>	<i># of Users</i>	<i>% of All Users</i>
ABG21	3798	4.8
AC314	1462	1.9
AT208	1908	2.4
BB220	153	0.2
Beeman	1734	2.2
BLL08	5985	7.6
CL469	751	1.0
CN313	810	1.0
HP101	4750	6.0
John-B	1049	1.3
LU121	155	0.2
Noyer	5055	6.4
NQ323	155	0.2
Palmer	1987	2.5
RB134C	5727	7.3
RB134F	2248	2.9
RB134G	256	0.3
RB134M	19593	24.9
Rogers	4601	5.8
SCL23	8600	10.9
TC709	1682	2.1
WB202	617	0.8
WB212	2055	2.6
WB213	1482	1.9
WB216	2215	2.8

Hardware Report

<i>Hardware</i>	<i># of Users</i>	<i>% of All Users</i>
SUN Station	716	0.9%
Macintosh	19795	25.1%
VT Terminal	20593	26.1%
IBM Compatible	37724	47.9%

Program Report

<i>Software Type</i>	<i>Program</i>	<i># of Program Users</i>	<i>% of Software Type</i>
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Courseware

ADAM	58	21.6%
DIETARY ANALYSIS SOF	108	40.1%
EDTECH CD	55	20.4%
SYBYL	48	17.8%

<i>Total # of Software Type Users / % of All Software Types:</i>	269	/	0.34%
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Database

Database	9	100.0%
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<i>Total # of Software Type Users / % of All Software Types:</i>	9	/	0.01%
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Desktop Publishing

Desktop Publishing	1598	96.3%
Quark Xpress	62	3.7%

<i>Total # of Software Type Users / % of All Software Types:</i>	1660	/	2.11%
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GIS

ARCINFO	145	32.3%
ARCVIEW	190	42.3%
IMAGINE	64	14.3%
ISLAND SOFT	50	11.1%

<i>Total # of Software Type Users / % of All Software Types:</i>	449	/	0.57%
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Graphics

Graphics	1214	88.9%
Photoshop	151	11.1%

<i>Total # of Software Type Users / % of All Software Types:</i>	1365	/	1.73%
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Internet

E-Mail	61451	97.9%
Internet	1166	1.9%
Netscape	151	0.2%

<i>Total # of Software Type Users / % of All Software Types:</i>	62768	/	79.63%
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Misc.

Other	111	100.0%
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<i>Total # of Software Type Users / % of All Software Types:</i>	111	/	0.14%
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Presentation Graphics

Premiere	1	100.0%
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<i>Total # of Software Type Users / % of All Software Types:</i>	1	/	0.00%
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Scanning

Deskscan(MAC)	5	19.2%
Scanning	21	80.8%

<i>Total # of Software Type Users / % of All Software Types:</i>	26	/	0.03%
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Spreadsheet

MS Excel	9	0.4%
Spreadsheet	2139	99.6%

<i>Total # of Software Type Users / % of All Software Types:</i>	2148	/	2.72%
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Word Processing

MS Word	11	0.1%
MS Word 97	96	1.0%
Word Perfect 7.0	44	0.4%
Word Perfect 7.1	1	0.0%
Word Processing	9870	98.5%

Total # of Software Type Users / % of All Software Types:

10022

12.71%